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COMPARATIVE ANALYSIS OF POWER AND SPEED INDICATORS LINEAR PULSE ELECTROMECHANICAL CONVERTERS ELECTRODYNAMIC AND INDUCTION TYPES

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Abstract

The purpose of the article is to determine the influence of the geometrical parameters of the windings of the inductor and armature on the power and speed characteristics of linear pulsed electromechanical converters (LPEC) of induction and electrodynamic types. A chain mathematical model of LPEC, describing interconnected electrical, magnetic, mechanical and thermal processes, has been developed. The geometrical ratios of the windings of the inductor and the armature (axial height, the number of layers and turns of the copper bus) are established, at which the maximum power and speed characteristics of the specified converters are provided. The power and speed characteristics of an electrodynamic type converter are higher than those of an induction type converter, but structurally it is more complex. In the most efficient induction type converter, significant losses occur in the inductor winding, and the losses in the armature winding are insignificant, which causes a relatively low efficiency of 10.9%. In the most efficient electrodynamic type converter, the losses in the inductor winding are reduced, and in the armature winding they increase, which causes an increased efficiency of 20.0%. Ref erences 10, figures 4.

Key words: linear pulse electromechanical converter, converter of induction type, converter of electrodynamic type, comparative analysis.

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